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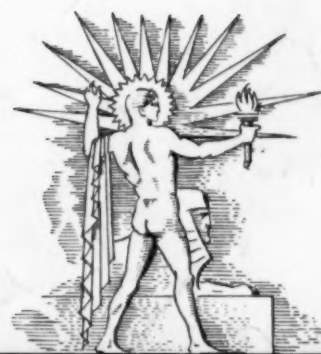
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



April 8, 1939

Atlantic Clipper

See Page 214

A SCIENCE SERVICE PUBLICATION

Do You Know?

A British writer, describing falconry, calls it the "golf and tennis of Tudor times."

More than 20,000 species of insects are known in the United States, and of these more than 6,000 rate as pests.

Japan requires gasoline to be mixed with five per cent alcohol, and will increase the amount until 20 per cent of alcohol is required.

It is not yet known whether chin-chillas raised in England will retain the silky quality of their fur in a climate so different from that of the Andes.

Almost three-fourths of all wheat crop losses are due to bad weather, a term which includes drought, hail, cold waves, hot winds, storms, and too much rain.

A colt's long legs are not "full length" at birth, as some people think; the average draft colt will add seven inches from elbow to ground by the time it is grown.

About 150,000 persons in the United States each year are injured permanently and seriously enough to prevent a return to work without rehabilitation assistance.

Excavations for a new block of government buildings on the site of Whitehall Palace, London, have uncovered foundations of royal apartments, a wine cellar, a great hall built for Cardinal Wolsey, and other historic remnants which will be photographed before work proceeds.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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Why are efforts being made to obtain early diagnosis in tuberculosis? p. 222.

Ebony is not always black.

Guatemala has ghostlike towns that are almost deserted through the year, but thronged with perhaps 25,000 people on special days.

When the New York World's Fair ground becomes a permanent park, four buildings will be kept as a sports arena, auditorium, field house, and boat house.

Nearly a million members of the Coptic church in Egypt consider themselves descendants of the ancient Egyptians.

Two sets of actors, one to appear on the stage and one to speak the lines from a sound booth, will be used to make sure that audiences can hear every word in "The Cavalcade of the West," outdoor spectacle at the San Francisco fair.

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MEDICINE

Sulfapyridine on First Day Ideal in Pneumonia Cases

Deathrate in Johns Hopkins Hospital Already Reduced By Two-Thirds, Physician Reveals at National Meeting

ALMOST all deaths from pneumonia could now be prevented if pneumonia patients were given proper treatment on the first day they got sick, Dr. Perrin H. Long of Johns Hopkins School of Medicine told members of the American College of Physicians meeting at New Orleans.

The millenium of no more pneumonia deaths, which probably could be achieved by the new chemical remedy, sulfapyridine, will probably never be reached, Dr. Long said, because pneumonia patients do not see a doctor on the first day they are sick—in fact, usually not until they are desperately sick.

Sulfapyridine, however, has cut the pneumonia death rate at the Johns Hopkins Hospital two-thirds, Dr. Long reported. Only eight patients have died of pneumonia there since last July 1, when sulfapyridine treatment was started. Of these, four had pneumonia serum treatment alone, one had serum plus sulfapyridine, and three had sulfapyridine alone. The total number of pneumonia patients was 107.

Serum would not be necessary in the treatment of pneumonia, Dr. Long said, if sulfapyridine could be given the patient the first day of his illness. From the standpoint of cost alone this would be a tremendous advantage. It costs about twelve dollars to treat a case of pneumonia by sulfapyridine but the cost of serum treatment is at least seventy-five dollars. Serum is not always available, whereas sulfapyridine is both available and effective in all types of pneumonia.

Dr. Long and Prof. E. K. Marshall, Jr., of Johns Hopkins have increased the efficiency of sulfapyridine by combining it with sodium. This makes it possible to inject the drug into the patient's vein, an advantage because in the first place many pneumonia patients are too sick to swallow medicines and in the second place it makes the drug act faster since it is now possible to get the most effective concentration of the drug in the blood within five minutes.

Sulfapyridine saves pneumonia-threat-

ened lives apparently by slowing down the growth of the pneumonia germs. This gives the patient a chance to build up his own immunity or resistance to them and so to recover. After the drug has been given the temperature goes down but the patient still has pneumonia until his immunity reaches the point of overcoming the invading germs.

Sulfapyridine is also useful in treating infections with staphylococci, the germs which cause boils among other things. It is too expensive to be used for boils but is being used in more serious staphylococcus infections. It is not, however, the final answer in these conditions. Something better must be found, Dr. Long said.

For streptococcus infections, the chemically related and older sulfanilamide is more reliable than sulfapyridine because it is more readily absorbed. At least five million persons in the United States have been treated with sulfanilamide, Dr. Long estimates, since he first introduced it from abroad in the fall of 1936.

Science News Letter, April 8, 1939

MEDICINE

New Germ Suspected of Causing Rheumatic Fever

THE BEST lead in recent years toward the solution of the major disease problem of rheumatic heart disease, which afflicts almost one out of every 100 children in the nation and kills at least 43,000 persons annually, has been obtained at the Hospital of the Rockefeller Institute for Medical Research.

A germ of an unfamiliar kind, which might be the cause of the disease, has been obtained from a number of patients with acute rheumatic fever. Description of the germ and the special technic by which it was obtained are reported by Drs. Homer F. Swift and Thomas McPherson Brown. (*Science*, March 24).

They have dropped other important work temporarily in order to push their investigations, partly because of the importance of the new research and partly

because now is the middle of the rheumatic fever season.

Drs. Swift and Brown do not claim that this germ is the cause of the disease, because they do not yet know whether or not it is.

"Further work will be required," they state, "to demonstrate the etiologic significance of these pathogenic agents in rheumatic fever."

If the pleuropneumonia-like organisms obtained by Drs. Swift and Brown from rheumatic fever patients prove to be the cause of the disease, there is hope that in the future a vaccine or similar method of protecting children from the ailment may be developed.

The pleuropneumonia-like organisms now under investigation because of their possible causative role in rheumatic fever belong to a class of germs that have not been very well studied. They are different from the more familiar kinds of germs that cause human ailments.

Science News Letter, April 8, 1939



DUMMY

This tumbler is made of such thin, porous clay fired at so low a heat that it could never hold a long, cool drink. People of Susa, in the region now Iran, made dummy dishes about 4000 B. C., thinking them right to use in graves. Artistically, the ware is admired by archaeologists, who say Susa's potters have "seldom been surpassed in workmanship." The Buffalo Museum of Science has received this tumbler and other pieces as a permanent loan from the Louvre in Paris, which explored Susa's ruins. This is some of the world's oldest pottery.

MEDICINE

Radio-Active "Cocktails" May Cure Dread Leukemia

Salt in Drink of Water Reaches Finger-Tips in Twenty Minutes, Tracing of "Tagged" Atoms Demonstrates

"COCKTAILS" of radio-active sodium phosphate may be medicine's life-saving weapon of the future against leukemia. Eight patients suffering from this always fatal, cancer-like disease of the white cells of the blood are being given this treatment now at the University of California School of Medicine, Prof. Ernest O. Lawrence told members of the American College of Physicians meeting in New Orleans.

It is much too soon, Prof. Lawrence emphasized, to be sure whether the results of this new treatment will be lasting and the patients permanently cured. So far, however, the patients are doing well. They may have to take their daily drinks of radio-active sodium phosphate in water for the rest of their lives, as diabetics take insulin. At present the new treatment keeps them well, as X-ray treatments do. Leukemic patients become immune to X-ray treatments after a time, however, and are no longer helped by them. Prof. Lawrence and his brother, Dr. John Lawrence, who is in charge of the medical work, hope that the radio-active material will continue to prove effective.

The sodium phosphate is made radio-active in the giant atom-smashing cyclotron which Prof. Lawrence developed as a tool for physical studies of atoms.

The cyclotron is also being tried as a weapon against cancer. Patients with advanced cancers have been getting weekly treatments since September with powerful neutron rays from the cyclotron. These rays are more powerful than X-rays and have a different effect on tissues. As with the leukemia patients, it is much too soon to know how lasting the results of the treatments will be in the cancer cases. The tumors have regressed and the physicians are very encouraged but it will be years before they will know whether the patients have been cured.

White mice that had been given the radio-active sodium phosphate "cocktails" showed their radio-active personalities to the physicians here by making a Geiger counter click when Prof. Law-

rence brought this instrument near their bodies. The Geiger counter is used to detect radio-activity of either natural radium or artificial radio-active substances. Cut flowers in a vase containing radio-active sodium phosphate in the water produced the same clicking on the Geiger counter.

This instrument, Prof. Lawrence predicted, will be installed in every medical laboratory in the future. Doctors will use it to detect tagged atoms of phosphorus, common salt, iron and iodine in patients' bodies. The tagged atoms of radio-active materials will have previously been injected or given in a glass of water. The Geiger counter will show whether the substance spread through the body normally or not and thus will aid in diagnosis of diseases due to faulty assimilation or utilization of necessary chemicals such as iron, iodine, salt and the like.

A drink of radio-active salt water shows in the finger tips in about twenty minutes, Prof. Lawrence explained. This is the time it takes the radio-active salt to reach the finger tips via the blood. The method is already being used to test the rate of blood circulation in patients with heart ailments.

The tagged atom procedure made possible by the cyclotron constitutes as important an advance for biology and medicine, Prof. Lawrence said, as the microscope.

New Test for Pellagra

A FURTHER step toward eradication of pellagra, Dixie's hard-times disease, appears possible in the light of a report by Dr. Tom Douglas Spies, of the University of Cincinnati and the Hillman Hospital, Birmingham.

New knowledge of how nicotinic acid cures pellagra by its effect on the body's chemistry was also reported by Dr. Spies. The chemical achieves its curative effect, at least in part, Dr. Spies has discovered, through its effect on one of the body's enzymes or ferments, codehydrogenase.

As an advance toward conquest of pellagra, it is now possible to detect the disease long before the rash and sore tongue appear and to prevent these and other more serious symptoms of the ailment, such as the mental delusions. Physicians should suspect pellagra, Dr. Spies advises, in patients who for a long time have had "vague, grumbling complaints" without apparent cause, loss of weight, strength and appetite, and indigestion. Cross, fretful children who for years have been below normal in weight and height and whose school progress has been slow should also be suspected of being in the early stages of pellagra. Investigation of the patient's diet and certain chemical tests of blood and other body fluids will clinch the diagnosis. Treatment with nicotinic acid in this early stage of the disease will quickly bring such patients back to good health.

Studying the diets of 50 pellagra patients, Dr. Spies and associates found that in almost every case the patient had not been getting enough calories, proteins, lime salts, iron and vitamins. In other words, they had not been getting enough meat, milk, eggs and fresh fruits and vegetables.

People living on such diets get not only pellagra but other ailments, such as the nerve disorder, beriberi. Nicotinic acid will cure the pellagra but to cure the other conditions certain other chemicals, the new synthetic vitamin B and flavin, are needed. Since both these and nicotinic acid can be obtained from food, Dr. Spies and other nutrition authorities urge the importance of a good diet for pellagra prevention. While the ailment is most common in poverty-stricken people, it also occurs in persons who follow an inadequate diet because of illness, chronic alcoholism or addiction to diet fads.

For his application of nicotinic acid to the cure of pellagra, Dr. Spies was presented with the John Phillips Memorial award of the American College of Physicians.

Shock Changes Brain Waves

BRAIN WAVES and the blood of mentally sick persons show definite changes during insulin shock treatment for their mental disorder, Dr. S. Katz-enelbogen of St. Elizabeth's Hospital, government institution for mental patients, reported.

Out of a group of 140 patients given the treatment for usually hopeless schizophrenia, the mental disorder in which

the patient lives in a dream world more or less oblivious to reality, 35 were free of all symptoms after treatment.

Doctors do not like to use the word "cure" but the layman would call these patients cured. Another 25 patients were improved. The other 79 showed no change after the treatment.

Used with considerable success in treating mentally sick people all over the world, the treatment has possibilities also, Dr. Katzenelbogen said, of adding to scientific knowledge of energy interchanges in the body and specifically of the body's utilization of sugar and of the role of insulin. For this reason, Dr. Katzenelbogen and associates, Drs. Alexander Simon, Anna R. Coyne, Charles E. Vigue and Robert Cohn, investigated the blood and brain wave patterns of the patients undergoing treatment.

'Flu Vaccine May Come

A VACCINE for protection against influenza and solution of the problems of virus-caused diseases such as infantile paralysis may be achieved by a new scientific approach described by Prof. Ernest W. Goodpasture, of Vanderbilt University School of Medicine, Nashville, Tenn.

This approach or technic, using chick membranes to grow viruses, may prove as valuable for the conquest of virus-caused diseases, though in a different way, as the new chemical, sulfanilamide, has proved for conquest of bacteria-caused diseases like streptococcus infections.

The anti-influenza vaccine particularly seems very close at hand. The virus of epidemic influenza, when cultivated on successive chick membranes, lost its disease-producing power to such an extent that it did not cause sickness when dropped into the nose. At the same time, it increased the level of the body's own flu-fighting forces in about one-half of those tested. Development of this weakened virus with good immunizing ability, which Prof. Goodpasture called "very promising for an eventual successful vaccine for human epidemic influenza," was achieved by Dr. F. M. Burnet and collaborators at the Hall Institute, Melbourne, Australia.

This and possible solution of other virus disease problems all hinge on the original discovery by Prof. Goodpasture and his associate, Dr. A. M. Woodruff, that the chorio-allantois of developing chicken eggs is an ideal substance on which to grow the virus that causes

fowl-pox. It has since been found that this same membrane of the developing chicken egg can be used for cultivating viruses of other diseases, including yellow fever and influenza, and for studying these viruses. Bits of human skin can also be successfully grafted onto the egg membrane and the grafts can be used to study virus infections.

Yellow fever vaccine, which has been used on over a million persons in South America, is now being produced from chick embryos.

Vaccine used to protect animals against the so-called horse sleeping sickness, which has spread to humans and killed several children last fall, is also being produced from virus grown on chick embryo membranes. If a vaccine is needed to protect humans from this animal plague, it may be produced in the same way.

Viruses such as cause these ailments and the more familiar infantile paralysis, unlike other disease germs, cannot be grown on chemicals outside the body. For this reason progress in the control of such diseases has lagged behind that in other diseases whose germs can be more easily cultivated and studied. Heretofore scientists have had to use laboratory animals and expensive monkeys in attempts to conquer the virus diseases. The chick membrane technic is far superior, Prof. Goodpasture believes, and should be more extensively used.

Barrier Against Germs

THE BODY'S Maginot Line against invading pneumonia germs, which bars their passage from lungs to blood, may have been located as a result of research reported by Dr. O. H. Robertson of the University of Chicago.

In the depression of the lung known as the hilum are lymph nodes which Dr. Robertson believes "may constitute the principal barrier to the passage of pneumococci from the infected lung into the blood."

The blood has certain natural pneumonia-germ-killing powers. Studying this during the course of pneumonia in dogs, Dr. Robertson found that usually so long as the blood could kill the germs, none could be found in the blood and the animal recovered. In numerous cases, however, the germs were found in the blood even when the blood had marked germ-killing ability. Given sufficient time, however, such blood, in test-tube experiments, was capable of destroying large numbers of pneumonia germs. Apparently the blood's (*Turn to page 221*)



BOMBS FOR LIGHTING

In each of these tiny glass capsules is a bit of metallic sodium, ready to be converted into gas that will give that easy-on-the-eyes golden glow to new lamps.

ENGINEERING

Explode Tiny Sodium Bombs To Produce Highway Lamps

THE golden-hued sodium vapor lamps which are coming into use for highway lighting are produced by miniature "bomb" explosions, it is reported from the research laboratories of the General Electric Company.

The explosions are necessary to transfer the hazardous sodium metal, which burns when exposed to air, to the long glass tubes that become the source of the golden-colored light.

The sodium bombs are little capillary tubes filled with the proper amount of sodium. One sodium bomb is placed in the lamp tube and after the tube has been evacuated a high frequency coil is placed about the tube. The extremely short radio waves from this coil induce electrical currents in any metal in their path. The only metal is the sodium sealed in the thin-walled bombs. The induced current heats the sodium metal. Soon a sufficiently high temperature is obtained to make the metal burst its thin-walled container.

Thus the sodium is released into the outer tube and is ready to become part of the sodium vapor lamp. The tiny fragments of glass, at the most only six thousandths of an inch thick, are simply left inside as an undistinguishable dust.

Science News Letter, April 8, 1939

AVIATION

Wings Over Water

Atlantic Clippers, Now Going Into Service, Have Long History of Pioneer Efforts Behind Their Shining Wings

By LEONARD H. ENGEL

TWENTY YEARS of unremitting effort will reap their due reward this spring with the opening of the first passenger-carrying airplane line across the toughest ocean of them all—the North Atlantic.

That is how long it has taken the youthful aviation industry to conquer this richest of all the world's trade routes.

For nearly four years Pan American Airways has been flying its great Clipper ships 9,000 miles across the Pacific from San Francisco to Manila and Hongkong. Air France and Deutsche Lufthansa have been spanning the 1,600-mile gap between Africa and South America with airmail. Until now, however, no heavier-than-air service has been operated across the North Atlantic.

Behind the brilliantly routine fashion in which today's flights are carried out is a history of not only daring airmen who risked their lives to show it could be done, but of accomplishment and training in other quarters of the earth which have made the America-to-Europe airline possible.

First Flight

It is more than a score of years since a memorable day in 1918. The Aircraft Committee of the Navy, wondering at the close of the World War what to do with the long-range seaplanes it had developed to combat the submarine menace, decided to show the world the Atlantic could be flown. So it was done—for the first time.

From that decision sprang the May, 1919, flight of the NC-4. Less than 72 hours were spent in the air between Long Island and Plymouth, England. There was trouble a-plenty on that journey, which included stops at Trepassey, Newfoundland, the Azores, and Lisbon. Two companion flying boats, the NC-1 and the NC-3, started out but never completed the trip.

Two weeks later, two British airmen won a \$50,000 prize offered by the London Daily Mail for the first non-stop flight across. Capt. John Alcock and Lieut. Arthur Brown, piloting a twin-

motored Vickers-Vimy bomber, went from St. John's Newfoundland, to Clifden on the Irish coast in 16 hours.

So great were their difficulties and risks, however (their plane, though it was one of the finest then in the air, was extremely crude by present standards) that their success was followed by few similar attempts for many years. Better aircraft and better engines first had to be developed by the engineers.

"Lindy" Flies

It was not until May 21, 1927, that Lindbergh put transatlantic flying on the map with his 33-hour solo flight from New York to Paris in the Spirit of St. Louis.

Two other flights were made that year by men who, like Lindy, were after the \$25,000 prize offered by a Paris hotelman, Raymond Orteig, for the first non-stop journey between New York and Paris.

Clarence Chamberlain and Charles A. Levene, his backer and passenger, reached Kottbus, a small town in Germany, in one hop from New York. Adverse weather prevented them from reaching Berlin, their destination. Admiral Richard E. Byrd added to his polar laurels a flight in the America. He reached Paris although fog forced him to turn back to the coast. And in later years, successful flights became commonplace—so commonplace that even a fiery Irish lad, Doug Corrigan by name, was able to make it in a small Curtiss plane without knowing quite where he was going.

In the 18 years between Brown and Alcock and the summer of 1937, engineers and inventors had taken giant strides. So, in that year, half a dozen countries began devoting serious attention to conquering the last ocean and tapping the richest trade route in the world.

Pan American's survey flights, half a dozen in number, were carried out in the Clipper III, a 21-ton Sikorsky flying boat which now plies between Baltimore, New York and Bermuda under the name Bermuda Clipper. To these flights, Panam brought the experience it had accumulated not only over the

Pacific, but above the Caribbean and down the long east coast of South America, where the bulk of its 50,000,000 over-water miles have been piled up since it started ferrying passengers between Miami and Havana a dozen years ago.

With passenger flights due to start within three months, Pan-American Airways expects to provide transatlantic air service four times a week at a total yearly cost of at least \$4,000,000 to the government in the form of postal subsidy.

Two flights in each direction each week will leave from New York or an alternate American port for Southampton. Two round trips a week are to be made between New York and Marseilles, according to a schedule of operations expected to be in effect by the end of the first year of operation.

Mail Trips

Panam officials anticipate making only one survey flight preliminary to scheduled mail and cargo trips, several of which are to be made before passengers are carried.

New York-London service by the northern route in the Clippers will take twenty-four and a half hours. The return trip will take slightly longer because of prevailing winds. It will be flown over the northern route, via Newfoundland and Ireland, only during the summer months.

The southern route, via the Azores and Lisbon to Marseilles in the summer, and to London as well in the winter, will take 43 hours. On this route, an overnight stop will be made at Lisbon.

American supremacy on the European run will ride the greatest airplanes ever built.

Nearly three years have elapsed since a July day in 1936 when representatives of the Boeing Aircraft Company and Pan American Airways, who had spent some seven years actively planning for their transatlantic route, signed a contract for six 82,500-pound flying boats which, when completed, would be the first carriers of air commerce on the new and larger style.

Four have now been delivered. The last of the six will be in the airline's hands by the middle of May. In the three years, the world's largest commercial airplanes



have passed from drawing boards to mock-up or wooden dummy through the biggest jigs in any aviation factory. Hulls completed in one building, and wings in another, they have been successively assembled outdoors, where there would be room to work on wings that stretch for half a city block and a hull that is 109 feet long. They have tasted the waters of the Duwamish River and of Puget Sound and have then been flown over to Lake Washington for trial.

Thick Wings

Wings are thick enough for a stooping man to walk through and reach the four full-height nacelles in which the engines are housed, for repairs in flight. Engines had never been accessible while aloft, before the Boeing engineers built the Super Clippers and the Super Flying Fortress, the Army's experimental giant bomber, which has the same wing.

There is no bending over near cabin walls on the passenger deck of this two-decked airplane, or on the flight deck either. Ceilings are full-height, walls square. The six or seven men who will be on duty at one particular time have as much space to work in as all 21 passengers on the largest domestic airliner now have to lounge in.

By day, 74 passengers, plus crew, can be carried. Forty can be accommodated on overnight flights either to Europe or over the broad stages of the transpacific airway. If gasoline for only an hour were loaded, the plane would be able to take off with upwards of 215 people.

There are seven passenger compartments—five regular passenger compartments, a big one in the center that is used as dining room, cocktail lounge, recreation room and entrance hall all in one, and a bridal suite for two back in the tail. Each is done in a different

color scheme. One is beige and rust, another turquoise blue and light green. Even the flight deck, where the crew is stationed, is heavily carpeted, and the seats are upholstered in leather.

The Boeing-type Super Clipper, first large flying boat to be built by the Seattle firm, is the latest item in a young, but already lusty, American tradition for multi-engined flying boats.

Clippers go back to 1930. Pan American Airways and the lines it was busily consolidating in expanding its network were flying 20,000-pound Consolidated Commodores. But Sikorsky, working hand in hand with Pan American's operations engineers in the production of overwater aircraft, was ushering in the Clipper era with the S-40, 34,000 pounds of four-motored air boat. Pacemakers in their day, they were outmoded in 1934 by the S-42, 40,000 pounds in gross weight and able to carry 32 passengers.

Airway Blazed

A year later the first Martin Ocean Transport roared its way across the Pacific to blaze the airway to Manila, and the 52,000-pound boat proved it was the ruler of them all. But it was not large enough for transatlantic service, so the next step, to the 82,500-pound Boeings, was taken. In the meantime, a 63,000-pound Martin transport was completed and sold to Soviet Russia. It added more luster to the American aerial shield.

Big as it is, the Boeing-built Super Clipper (B-314, to its builders) is not the largest ever built. Back in 1929, a daring German designer, Dr. Albert Dornier, built a 46-ton "white elephant"—the DO-X. Powered by 12 engines, it flew across the Atlantic and back, but it never got anywhere. Like the colossal steamship of 1858, the "Great Eastern," it was years ahead of its time. It was

YANKEE CLIPPER

Bearer of a glamorous name, the great ship of the air attracted the awed attention of thousands of people as it rested on the water, ready for its pioneering flight over the Atlantic.

inefficient—neither materials, nor engineering skill, nor engines to make it practical existed. There was no traffic to justify it.

Novel features galore mark the Yankee Clipper, first to reach the Atlantic, and her sister ships. Her triple rudder, which replaced a single fin which experience showed did not provide enough tail surface for taxiing on the water, has not been seen on any but comparatively small-sized airplanes. More like a ship in many respects than a plane, the Yankee Clipper carries an 80-pound stainless steel anchor.

The Clippers, declares Capt. Harold E. Gray, who flew the first one across the continent, handle extremely easily and lightly. Two unusual engineering features account for this. A patented "booster" tab system on the control surfaces boosts the forces exerted by the pilot on ailerons, rudder, and elevators. The plane's wing loading (gross weight divided by wing area) is low, about 28 pounds per square foot. The 42-ton Clipper may be said to "float" up there in the sky.

Seemingly effortless, their million-mile journeyings will have behind them a complex organization of men and materials on the ground to make their performance possible. Already, this organization has taken very nearly its final shape. Hidden behind a facade of smooth operation, it escapes the eye. Without it, not one of the aluminum birds would fly.

(Turn to page 219)

OCEANOGRAPHY

Icebergs Crowd Steamers Into Southern Track Early

ICEBERGS are getting into the transatlantic steamer tracks early this year, the International Ice Patrol reports. Recommendation that shipping shift from Track C southward into the safer Track B has already been made to the North Atlantic Track Conference by the U. S. Coast Guard, whose three patrol steamers, Champlain, Chelan and General Greene, are now on station in the berg-infested waters of the Newfoundland banks.

A small iceberg of the "growler" variety has been sighted in 43 degrees north latitude (latitude of northern Massachusetts) and a really big berg in 45 degrees north (latitude of southern Nova Scotia). Smaller ice masses have been frequent. It is this early southward migration of the ice that has caused the early recommendation for shift in steamer tracks. Usually shipping does not resort to the safer but longer southern track until April 11.

Science News Letter, April 8, 1939

AGRICULTURE

Three New U.S. Laboratories To Study Tung Oil Problems

HOW research in three new laboratories, at Bogalusa, La., Cairo, Ga., and Gainesville, Fla., will benefit agriculture in the South and the makers and users of paint, varnish, linoleum and a dozen other products everywhere, was told by Dr. Henry G. Knight of the U. S. Department of Agriculture, speaking at the meeting of the American Tung Oil Association in Gulfport, Miss.

Tung oil, the product of a Chinese nut tree, is used in quantities ranging from 100 to 175 million pounds a year. The new tung plantations along the Gulf Coast as yet yield only about four million pounds of the oil. Increased domestic production is sought, to keep the tung oil users' money at home as well as to improve the quality of the product.

No scientific research on either the oil or the trees that are its source, has ever been conducted in China. America must do its own researching as well as grow its own tung trees.

Two main lines of investigation will be pursued by the scientists in the new laboratories, which will be equipped and going concerns by May 1, Dr. Knight explained. Two U. S. Department of Agriculture bureaus, Plant Industry and Chemistry and Soils, will collaborate in all three places.

Biological scientists of the Bureau of Plant Industry will search for the causes of variation in size, rate of growth and especially productivity of the trees. They will study their reactions to different conditions of soil, moisture, temperature and other environmental factors. They will try to find or breed better varieties of tung trees, producing more nuts with higher content of better quality oil.

Indoors, chemists will work on better methods for extracting the oil. At present, pressing is the mode, and that leaves too much of the valuable oil in the press cake. Chemical solvents, like those used on some other kinds of oil seeds, will be tried on the tung nuts. By-product outlets for the wastes of the industry, particularly the troublesome huge quantities of nut hulls, and the oil cake left after completion of the pressing process, will also be sought.

Science News Letter, April 8, 1939

GENERAL SCIENCE

Scientist Group Boycotts German Apparatus

BOYCOTT of German-made scientific apparatus and supplies has been voted by the Boston and Cambridge branch of the American Association of Scientific Workers as an expression of "disapproval of the Nazi attitude toward science and scientists."

The organization, representing more than one hundred scientists of Harvard, Massachusetts Institute of Technology, and neighboring institutions, voted to enlist in the boycott the cooperation of other chapters of the A.A.S.W. and of other individuals and non-scientific groups, and to attempt to interest American manufacturers in producing satisfactory substitutes for German scientific goods.

American scientists as a body, it is believed, could exert pressure on about \$8,000,000 worth of imports from Germany, including about \$1,500,000 worth of equipment used in university research laboratories, and the rest in supplies used by industrial organizations. Last year the United States imported about \$10,000,000 worth of German scientific equipment, cameras, and non-agricultural chemicals. Over 80 per cent. of American imports of scientific equipment came from Germany.

Most of the equipment might well be purchased outside of Germany, according to the findings of a special committee of the scientists.

The boycott will not apply to German scientific books and periodicals.

Science News Letter, April 8, 1939

IN SCIENCE

MEDICINE

Babies Are Vaccinated Against Whooping Cough

VACCINATION for whooping cough attempted in a San Francisco clinic for well babies has demonstrated its efficiency.

The vaccine used conferred complete protection on some of the children and partial protection on others. Typical whooping cough developed in only three of the children exposed and they had been vaccinated at least 18 months previously.

Children vaccinated within the year escaped the disease even when exposed.

Annual reinjection with a small amount of vaccine is thought advisable by the Stanford University physicians, Drs. John J. Miller, Jr., and Harold K. Faber, who report on immunization for whooping cough. (*Journal, American Medical Association*, March 25)

Science News Letter, April 8, 1939

ECONOMICS

Anti-Nazis Have Advantage In the Sinews of War

THE ANTI-NAZI front of Great Britain, France and the U.S.S.R. commands an overwhelming superiority of raw materials and the sinews of war over the three powers of the Berlin-Rome-Tokyo axis, a survey prepared by Science Service showed.

Germany, Italy and Japan will have to fight a poor man's war if they and their opponents elect to make a battle of it. Almost every one of the major commodities without which no war machine can exist and without which the Imperial German army cracked nearly a generation ago is lacking inside the Reich's borders.

Iron ore, petroleum, wheat, rubber, copper, the lesser but just as vital minerals such as tungsten, molybdenum and tin—these and many more are to be found within the continental limits of the three allied powers or the empires and territories they control. Even without the resources of the United States, the anti-Nazi front will have an overwhelming superiority.

Science News Letter, April 8, 1939

THE FIELDS

GENERAL SCIENCE

Rockefeller Foundation Warns of Cultural Crisis

WARNING that "for the moment at least the world is facing a cultural crisis in which reason is everywhere in retreat," the Rockefeller Foundation's annual report just issued states:

"If the problems arising out of human relations are to be solved at all, it will be through the same scientific approach to facts, made in the same dispassionate spirit of inquiry, which has given man command over this physical environment."

Acting on this faith, the report explains, the Foundation devoted \$834,000 of its funds last year to objective research in international relations that gives promise of stemming the "retreat from reason."

Science News Letter, April 8, 1939

PHYSICS

Atomic Energy Cannot Compete as Power Source

NOW that scientists have discovered how to release a large share of the energy locked inside uranium atoms there is natural speculation on the use of atomic energy as a commercial source of power. Much quoted is the theoretically true statement that the energy locked within the atoms of a bucket of water would drive an ocean liner across the Atlantic.

However, a bit of figuring on the costs involved shows that even uranium cannot compete with coal as a source of power in terms of cost per energy available.

Scientists at Carnegie Institution of Washington who have actually been releasing uranium's energy in their experiments say that if coal costs ten dollars a ton, uranium in its purest state would have to sell for the ridiculously low figure of \$2.50 a gram to compete with it on an energy basis. Uranium at \$2.50 a gram means several million dollars a ton.

As a matter of fact the term pure uranium has little meaning for you cannot buy any pure uranium in the world

at any price whatever. Uranium is associated with numerous isotopes that are most difficult to separate and the need for pure uranium has yet been unimportant.

Nearest indication of what pure uranium would cost to produce comes from cost figures for radium, which is much easier to obtain in a pure form, but which nevertheless sells for about \$25,000 a gram. Probably it costs half that to produce. A fair guess is that a gram of pure uranium would cost, *not sell for*, about \$25,000.

But note that uranium must sell for \$2.50 a gram to compete economically with coal as a source of power. This means that uranium is some 10,000 times too expensive to become a rival of coal at the present time.

Science News Letter, April 8, 1939

PHYSIOLOGY

Vitamins Found Important To Health of Mouth

NEW findings which show the importance of proper diet with plentiful vitamin rations for mouth health have just been reported by Drs. N. H. Topping, H. F. Fraser and T. H. Tomlinson, Jr., of the U. S. National Institute of Health.

Monkeys kept on diets lacking in vitamins, their report shows, developed every kind of mouth ailment from bleeding, receding gums and loosened teeth to trench mouth or Vincent's infection and ulcers that went right through the cheeks from inside to outside.

The last condition, with the horrible sores on the cheeks, is like noma, a very fatal disease which used to be rampant in orphanages and other institutions. This is the first time noma has been produced in monkeys, the public health scientists point out in Public Health Reports, official publication of the U. S. Public Health Service.

Germs of the kind believed to cause trench mouth in humans flourished in the sore mouths of monkeys living on the vitamin-less diets. Some of these germs were inoculated onto the gums and cheeks of other monkeys living on a good diet. None of these monkeys on the good diet developed any signs of inflammation of the gums. Whether this means that poor diet instead of germs is the cause of trench mouth in humans cannot be determined without further study.

The poor diets that induced mouth ailments in monkeys were lacking in either vitamin A, or C, or D, or nicotinic acid or riboflavin.

Science News Letter, April 8, 1939

CHEMISTRY

Chemical Society Gives Two \$1000 Awards

AWARDS of \$1,000 each to two outstanding chemists were presented by the American Chemical Society at its Baltimore meeting. The Eli Lilly and Company Award in Biological Chemistry went to Dr. George Wald, instructor in biology in Harvard University, and the Borden Company Award to Dr. L. S. Palmer, professor of agricultural biochemistry in the University of Minnesota.

Dr. Wald, who is thirty-two years old, was honored for fundamental work in the field of biological chemistry, and particularly for his researches on the relation of vitamin A to the human eye.

Dr. Palmer received the Borden Award for "achievement in research in the chemistry of milk". He is a pioneer investigator in the chemistry of milk production, and his studies, reported in more than sixty scientific publications, embrace many fields, including the relation of dairy feeding to milk production, the pigments of milk and butter, cause of butter defects and storage troubles, the physical and colloid chemistry of milk and of the churning process, the physical chemistry of rennet coagulation of milk, and the mineral needs of dairy cattle.

Science News Letter, April 8, 1939

MEDICINE

High Blood Pressure Clue Found by Wrapping Kidney

AN IMPORTANT clue to the cause of high blood pressure has been discovered by Dr. Irvine N. Page, of the Lilly Laboratory for Clinical Research at the Indianapolis, Ind., City Hospital. Persistent high blood pressure has been produced in experimental animals by wrapping the kidney in sterilized transparent cellulose sheeting, Dr. Page reports. (*Science, March 24*)

It is possible, Dr. Page says, that some patients develop high blood pressure from inflammation of the peritoneal envelope and other tissues around the kidneys. Such inflammation may produce a constricting hull around one or both kidneys, probably diminishing the blood supply to these organs. Such a constricting hull was found around the kidneys of animals that developed high blood pressure after the wrapping had been applied.

Science News Letter, April 8, 1939

PHYSICS

Two More Elements Identified In Splitting of Uranium Atom

TWO MORE elements — xenon and strontium — have been identified chemically as the products of the splitting of uranium in atom smashing experiments, it is reported by Prof. Otto Hahn and Dr. Fritz Strassmann at the Kaiser Wilhelm Institute for Chemistry at Berlin-Dahlem.

It was Prof. Hahn's discovery that the bombardment of uranium with neutrons would not only split the uranium into fragments but also that tremendous amounts of atomic energy would be released in the splitting. Energies of over 100,000,000 electron volts have been already reported experimentally.

Prof. Hahn's new discovery, announced in *Die Naturwissenschaften*, (March 10) brings to six the number of chemical elements which have now been identified in the uranium splitting under bombardment. These elements are: barium, lanthanum, strontium, yttrium, xenon and caesium.

As the fragments of the exploding uranium atom are further identified chemically, it becomes apparent that there are no set rules for the production of uranium's fission products. It seems only necessary that the fragments should

have atomic weights which add up to the atomic weight of uranium 238 plus a neutron of mass one, or a total of 239.

In a simple picture the two splitter fragments might each have approximately half the atomic weight of the unstable form of uranium having mass 239. This would be a chemical element of atomic weight 119 and the nearest thing to this number is the element tin. Actually this element, obtained by a true 50-50 splitting, has not yet been found.

Barium, atomic weight 137.9, was the first one identified and its complementary element (to bring the total mass to 239) is the inert gas krypton.

How relatively light elements like strontium, atomic weight 87, and yttrium, atomic weight 88.9, can appear is a bit puzzling, but can be explained by picturing the splitting of uranium into three fragments instead of two.

A combination of three such fragments that would have an additive mass of 239 would be two strontium atoms each of mass 87 and a zinc atom of atomic mass 65. Strontium has already been identified, but zinc is yet undetected.

Science News Letter, April 8, 1939

ICHTHYOLOGY

Twin to Dinosaur-Age Fish Washed Ashore and Lost

THE STRANGEST true fish story in history, just unfolded in South Africa, has developed one oddly conventional twist—the big one got away.

Scientists of three continents are all agog over the catch, near the port of East London, on the southeast coast of South Africa, of a big blue fish belonging to a family supposed to have become extinct 50 million years ago. (See *SNL*, April 1) Dr. J. L. B. Smith of Rhodes University College, describes the five-foot, blue-scaled, archaic-styled monster. (*Nature*, March 18). He adds:

"After careful inspection of the mounted specimen, a responsible citizen-angler of East London stated that about five years ago he had found precisely such

a fish, only considerably larger, partially decomposed, cast up by the waves on a lonely part of the shore east of East London. When he returned with assistance, the monster had vanished with a risen tide." The big one had got away.

However, Dr. Smith draws some comfort from the fact that a second fish of the same kind has been seen, even if not kept. Deep-sea trawling might conceivably bring in more specimens. The one now in the East London Museum was brought up with a haul of other fish from a depth of 240 feet, but it is considered likely that its actual habitat is deeper than that.

One argument for its belonging to deep water is found in the great size of

its eyes. Fish from considerable depths are likely either to have very large eyes, to catch what few scraps of light there may be, or else to give up the struggle altogether and get along eyeless and blind in the dark.

It is a great disappointment to scientists that owing to inadequate facilities for preservation in East London the flesh and internal organs of the "dinosaur-age" fish could not be kept. Spoilage was so rapid that the carcass had to be disposed of, and only a few small parts were kept, apart from the skin which was mounted by the East London Museum taxidermist.

Dr. Smith has given the strange fish the scientific name *Latimeria Chalumnae*. The first or generic name is a scholarly bow to Miss Courtenay Latimer, curator of the East London Museum, who was the first scientist to examine it. The second or specific name is a reference to Chalumna, the point on the South African coast in sight when the trawler hauled in its astonishing catch.

Science News Letter, April 8, 1939

GEOGRAPHY—BIOLOGY

Cocos Island Is Still Largely Unknown World

COCOS Island, proposed as a site for outlying defenses of the Panama Canal, may yield scientific surprises if it is acquired by the United States and systematically explored. It is still largely an unknown world so far as its plant and animal life is concerned.

Of particular scientific interest is the presence on Cocos of a number of species, among the smaller animals, that show relationship to the fauna of the more remote Pacific islands. Better acquaintance with these "disjunct" species may reveal facts of importance concerning ocean currents in the past.

Most recent of the expeditions that have touched on Cocos' shores was the Presidential party aboard the U. S. S. *Houston* when a stop was made during President Roosevelt's fishing cruise last July and August. The *Houston* lay to off the island Aug. 1 to 3. Among the party was Dr. Waldo L. Schmitt of the U. S. National Museum, who examined all fish caught for matters of biological interest, and also made landings to collect along the beach and up into the hills.

Most important of his collections ashore were specimens of a genus of palm trees hitherto unknown to science. It is being described and named in a forthcoming Smithsonian Institution

Science News Letter, April 8, 1939

MATHEMATICS

Old Mathematical Puzzle Still Intrigues Science

ONE of the great mysteries in the history of mathematics is known as Fermat's last theorem. In the year 1637 brilliant Pierre Fermat, great French mathematician, wrote in the margin of an algebra book this statement:

"If n is a number greater than two, there are no whole numbers, a , b and c such that a^n plus b^n equals c^n . I have found a truly wonderful proof which this margin is too small to contain."

Unfortunately after Fermat's death in 1665 an examination of his papers showed that he never wrote out this "wonderful" proof. And in so doing Fermat left a mystery which probably every first rate mathematician since his time has puzzled over at least once.

Many of Fermat's mathematical followers spent entire lives on the problem and at least three large cash prizes (one in 1907 amounting to nearly \$25,000) have been offered for a solution to Fermat's moment of inspiration. Like some modern movie or cigarette contest these prizes produced a veritable avalanche of "solutions", mostly from amateur mathematicians, and all false proofs. The present status is that the theorem has been proved for values of n less than 617.

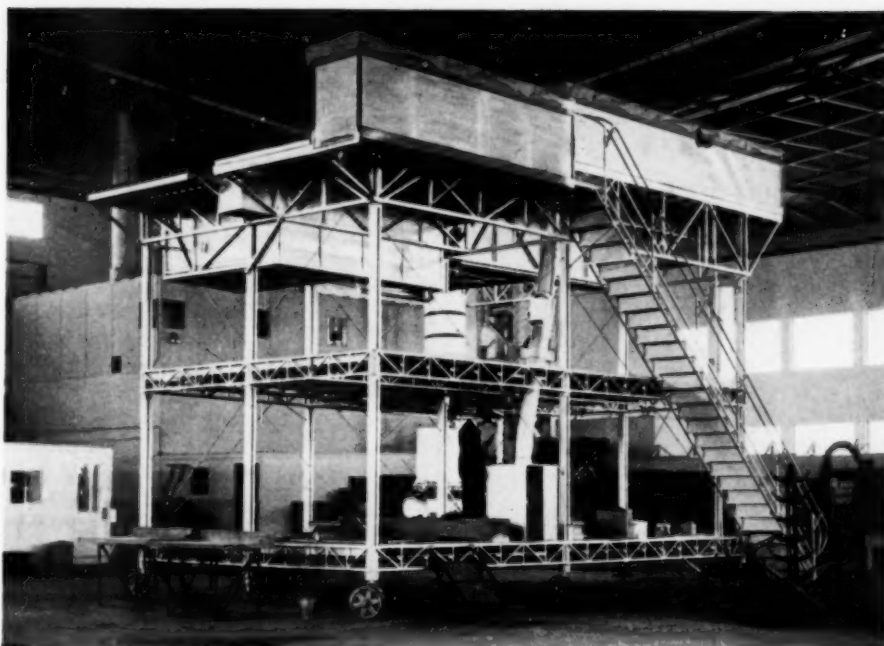
Reporting recently to the American Mathematical Society, Dr. J. Barkley Rosser of Cornell University described a method of treating a special, simplified form of Fermat's famous theorem so that many values of n can be handled at once. With this method he has proved this special case for all values of n less than 8,332,403.

This special form puts on the restriction that the number n must not divide a , b , or c . Previously Dickson in 1908 had proved this case for numbers up to 7,000 and in 1925 Beeger did it for numbers up to 14,000. By comparison Dr. Rosser's contribution is enormous.

Science News Letter, April 8, 1939

RADIO

Prof. E. O. Lawrence, Director, Radiation Laboratory of the University of California, will be the guest scientist on the Science Service "Adventures in Science" program over the coast to coast network of the Columbia Broadcasting System, Saturday, April 15, 6:15 p. m. EST, 5:15 p. m. CST, 4:15 p. m. MST, 3:15 p. m. PST. Listen in on your local station. Listen in next Saturday.



"HOUSE ON WHEELS"

To give mechanics adequate working space while they are conditioning the huge planes between flights, this moveable double-decked staging has been constructed in Baltimore.

From Page 215

Its invisible strands reach out from a stately New York skyscraper, where Juan T. Trippe and his busy fellow-executives may on a bright day see almost to the Long Island operations base from which the Clippers point their streamlined snouts eastward. The threads stretch out, too, from a building of immense proportions on a fill of land jutting into Chesapeake Bay just below Baltimore.

The crews of the four Clippers earmarked for the Atlantic service will total between 40 and 50 men. But to keep them in the air and to fill their compartment with passengers and freight a regiment of at least 500 will be required. A hundred professions are represented. Men trained in widely varying fields of work will be at their appointed stations on the day the first plane takes off. Radiomen who will keep in touch with the plane in flight will be there, at New York, Bermuda, Horta, Lisbon and other strategic points. Skilled meteorologists are already at work plotting the Atlantic weather. Even "front office" men have their appointed place in the detailed organization—to persuade you, the traveling public, to part with approximately \$325 one way or \$585 round trip; to satisfy your individual wants and desires; to plan cruises and European tours.

The complicated network on the At-

lantic itself has been formed only during the last few years. Methods and organization were learned on the Caribbean and proved across the Pacific. In that time, Panam has learned aviation's lesson; the price of safe, regular operation is strict attention to the most minute details.

A transatlantic flight may take 25 hours to the passenger, but to the band of 100 men who will participate actively in its execution, it will last more than twice that length of time.

Twenty-four hours before the first passenger appears, skilled weathermen and air operators will already be at work laying the groundwork for a sheet of paper on which the plane's safe journey will largely be guided. It is the flight plan or flight time analysis—traffic department guide, crew bible, ground flight watch manual—more responsible for the great safety advances of the last decade than any other single contribution.

Before any commercial airplane flight leaves today, the pilot and dispatcher, if on a land line, or the master and operations manager, if on an overwater route, such as the airline across the Atlantic, will know, almost to the minute, what the duration of the flight will be. They will know the quantity of fuel that must be loaded to insure a safe margin, one-third more than should be required, and how it must be used; how many passengers and how much cargo may safe-



SPARES

Three of these blades make one propeller. Many of these spare blades are kept in each of the servicing bases.

ly be carried. The plan will contain data and instructions for every man in the multiple flight crew aboard the giant flying boat.

Weather maps will be drawn four times daily, to facilitate laying of flight plans. Even while Pan American Airways meteorologists keep a sharp watch on their own stations and on ports of call, they will also watch the district to the north and west of the departure point, and the area between Canada, Greenland and Iceland. In this way, they will be able to foresee coming weather at the start and along the way, for weather in the northern part of the western hemisphere comes in, generally speaking, from the north and west.

If adverse winds are exceptionally strong, the payload will be cut accordingly; if they are phenomenal, the flight may even be cancelled. The Clipper must always have aboard at take-off enough gasoline to take her one-third farther than her destination. And it is required to land at its destination with that reserve intact, to be used only in emergency.

Should weather conditions change, the master and the operations manager, kept in contact by radio, can naturally change the plan in flight. Pan American Airways pilots in general will not pay particular attention to conditions at their destinations in Europe at the time they take off. "A lot can happen to the weather in 24 hours," Allan C. Clark, division

meteorologist, explained. "It may be terrible in Southampton when a plane clears Baltimore and New York, and still be nearly ideal by the time the ship reaches the other side.

"Besides, in a couple of thousand miles across the Atlantic, you have plenty of room for turning slightly and heading for an open port."

At last the flight time analysis has been approved by the captain and Operations Manager Clarence H. Schildhauer. The last passenger and letter is aboard. The flight plan is in action.

But it doesn't end here.

A continuous record of the ship's passage is kept ashore as it wings its way across the Atlantic. Every half hour, a radio operator aboard the plane flashes back to the home port the Clipper's position and a weather report.

Exact fulfillment of the flight plan, the be-all and end-all of airline operation as the surest means to safety, is

facilitated by the careful subdivision of activities on the flying Clippers.

Much too large for the three-man crews familiar on the domestic airliners, the flying Clippers will be manned by Pan American's basic five-man crews, plus several junior flight officers. Though the passenger may see only two stewards, above him on the flight deck will be working at least six or seven men at a time.

Engine performance, in accordance with the flight plan, will be watched by a flight engineer and one or two assistants. Navigation is the duty of the pilot members of the crew, with principal responsibility delegated to one man; operation of the Morse radio transmitters and receivers is the duty of a specialized radio officer. Two pilots will be up front. Coordinating their activities is the master. And his primary job is to bring his ship home—in line with the flight plan.

Science News Letter, April 8, 1939

PSYCHOLOGY

Old Folks Need Clubs For Happy Adequate Life

THE THREE ages of man are childhood, the working and child rearing years, and old age.

In the world's handling of the first three score years, striking progress has been made. School and home take care of about the first twenty, and there is prospect that in the coming years, nursery schools for those 2 to 6 will find wide usage to preface happily the schooldays of the present. For adults, social security is being attempted and parenthood is being made more intelligent.

With the coming of the pleasant evening of life, the years that begin at 60, 65, or 70, depending upon circumstances, perhaps the most difficult period of life begins, an interval for which our community is not well equipped.

Old age is a new phenomenon on today's scale. When mankind was young, a person of 40 was old. The rigors of life, disease, war and privation solved the old folks problem. Never before in history were there so many above 60 as now. And our population is aging. In ten years more than a tenth of our population will be over 60. There will be more of these old folks than children under six.

A critical time of life comes when the children leave the parental nest to

establish their own homes. How disappointing it often is to achieve affluence, build the dream home, only to find that with the children gone they do not need it. Nor is financial security the complete answer. Prestige and desirable social setting are more important.

What the world really needs are clubs for old folks, not institutions like the average home for the aged and poor farms, but voluntary residences as respectable as Florida and California havens for the elderly rich. They should be much more socially and intellectually adequate, tuned to after-sixty problems as scientifically as nursery schools handle the preschool problem.

Science News Letter, April 8, 1939

MSS. REWRITTEN

Experienced writer of technical articles puts your dictated notes or rough manuscripts into clear, interesting form. Also advice on placing, illustrating. No charge for mail consultation. Rewrite fee moderate. Address Frank Lloyd Brille, 337 E. 85th St., New York City.

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ability to destroy the germs is not the only factor in keeping them out of the blood during the disease.

Searching further, Dr. Robertson found that in dogs with pneumonia but with no pneumonia germs in their blood, large numbers of these germs were often found in the lymph nodes. This and other findings suggested that the lymph nodes in the hilum of the lung act as chief barrier between lungs and blood.

Remedy For Chronic Colitis

PATIENTS suffering from a serious and chronic disease which in some ways resembles the fashionable ailment, colitis, have been helped by treatment with one of the new chemical remedies related to sulfanilamide, it was announced at a meeting of the American College of Surgeons.

This latest addition to the long list of diseases which are being conquered by sulfanilamide or its derivatives is chronic ulcerative colitis, an unpleasant ailment which, while not directly fatal, weakens the patient and makes him anemic due to loss of blood so that he is likely to die of some infection that a healthy person could throw off.

Neoprontosil, given by mouth, brought "favorable results" in 49 cases of this condition, Dr. A. E. Brown of the Mayo Clinic reported. Some of the patients were given serum or vaccines in addition to the chemical remedy, but 29 of them were helped by the chemical treatment alone.

"We do not feel that neoprontosil (oral) is a specific or a cure for chronic ulcerative colitis," Dr. Brown said in reporting the results obtained by himself and his colleagues, Drs. Wallace E. Herrell and J. Arnold Barger.

They feel, however, that the results with this chemical and the fact that it does not produce symptoms of poisoning "amply justify its continued use in the treatment of chronic ulcerative colitis." They had previously tried both sulfanilamide itself and another of its derivatives as a remedy for this chronic sickness, but were obliged to abandon these because they produced toxic symptoms before the patient was well.

The sulfanilamide chemicals were first considered for use in treating this condition because of their effect in streptococcus infections and because a germ related to the streptococci might be the cause of chronic ulcerative colitis.

Science News Letter, April 8, 1939

MEDICINE

This Year's Epidemic Wasn't Real Influenza

No Such Thing as "Intestinal 'Flu'", Doctor Declares; Similar Upsets Occur in Other Infectious Diseases

TENS of thousands of people who were sick, presumably of influenza, in the epidemic which is only now tapering off, did not have true influenza at all, in the opinion of Dr. Thomas Francis, Jr., of New York University College of Medicine. Neither Dr. Francis nor other scientists with whom he has talked were able to detect the virus of true influenza from patients this season.

Not every patient in this year's epidemic, of course, was given the two tests which Dr. Francis described for detecting influenza, but the evidence from those who were tested shows that the epidemic was not influenza but some other infection of the nose and throat which caused coughs, laryngitis and other symptoms.

The tests Dr. Francis described depend on the fact that in true influenza on the fourth day the patient is sick his blood develops a large amount of flugerm-fighting substances called antibodies. This increase in antibodies can be detected even when the influenza virus cannot be obtained from the throats of the patients, but the increase does not occur unless the patient has been attacked by influenza virus.

There is no such thing as "intestinal flu," Dr. Francis declared. Patients with influenza may have an intestinal upset, he explained, but so do patients with scarlet fever and other infectious diseases.

True influenza starts suddenly, often with chills, and constitutional symptoms and headache predominate, and

the course of the disease is usually short. These symptoms should help doctors distinguish it from other infections. Laryngitis with hoarse voice and exudate are not present in influenza.

Epidemic influenza, Dr. Francis declared, is not related to the common cold in any stage of the illness.

Influenza on Wane

INFLUENZA (that is, what is being called influenza this season) is on the wane, and favorable conditions prevail throughout the United States so far as communicable diseases are concerned. This is the verdict of the U. S. Public Health Service, based on recently compiled health figures.

That the influenza season has passed its peak is inferred from a continued drop. For the week ending March 25, new cases numbered 14,809, with a few states not heard from. The largest number were reported by Alabama, Texas, Virginia, South Carolina and Arkansas.

New cases of infantile paralysis are near a low ebb. The week of March 18, with only nine new cases, made a low record not equalled since April, 1935. Thirteen cases were reported the week of March 25.

Smallpox has been running a score of 300 or more new cases weekly since the first of the year, but dropped to 248 cases the past week. Although the form is non-virulent, health officials warn that it might take a more serious turn.

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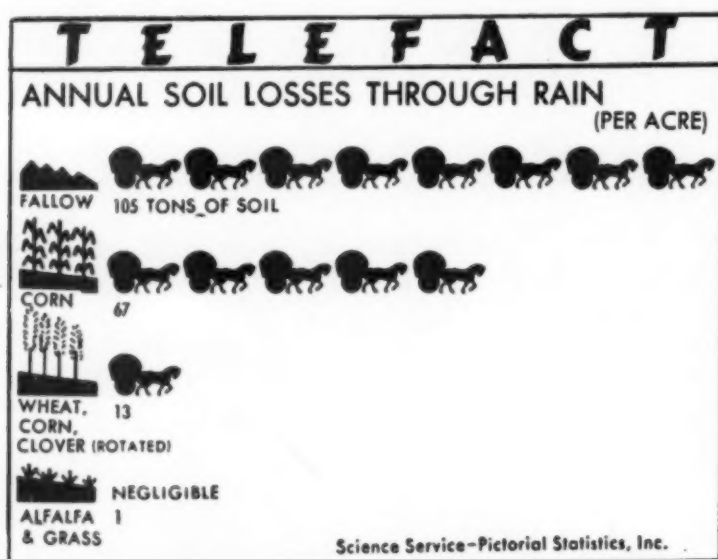
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ARCHAEOLOGY

Sling-Stone Fighting Clue to Britain's Past

IN THE LIGHT of present international upheavals, ancient European struggles seem more vivid. A British archaeologist, Dr. R. E. Mortimer Wheeler, has found in France new evidence from the time when Caesar's Roman legions were invading that region and finding the Veneti a stubbornly resistant tribe.

Dr. Wheeler thinks that when Caesar did vanquish the troublesome Veneti in their homeland in northwest France, now southern Brittany, a remnant escaped to settle in Britain. But within a century, a colony of these refugees themselves had to face Roman arrows and sling-stones when Vespasian invaded Britain and attacked Maiden Castle in 43 A. D.

It was to seek the origin of the im-

migrants who so fiercely defended Maiden Castle that Dr. Wheeler recently went to France. He had just finished excavating Maiden Castle, and finding the ruins and battered skeletons mute evidence of terrible battle. The Roman soldiers took rampart after rampart, advancing up sloping, winding tracks that led maze-like up to the castle. Roman siege catapults shot arrows, and slingers on raised platforms fired stones. Flimsy huts were fired. When the castle gates fell, the siege was over. The defenders at night hastily buried their dead.

The defenders were not old natives of Britain, but foreigners recent enough to retain their own striking plans for fortification. Their multiple line of ramparts was defense against a new weapon—the sling. Sling-stones in quantity showed that both sides used this weapon. Other recent discoveries have indicated that these foreigners with their own brand of civilization were elsewhere in southwest Britain.

Dr. Wheeler sought these old immigrants until he reached southern Brittany and examined fortified works of the Veneti in their homeland. Multiple ditches and quantities of sling-stones were conspicuous there, he reports to the scientific journal *Nature*. The Veneti, who figured in Caesar's Gallic wars, now have a new chapter written into their history.

Science News Letter, April 8, 1939

PUBLIC HEALTH

Tuberculosis Fighters Ask Help of Leaders

LEADERS in the fight to save lives threatened by tuberculosis are asking help from leaders of industry, youth, community groups, fraternal orders and the clergy. The cooperation of the lay leaders is being sought as part of the early-diagnosis campaign which the National Tuberculosis Association is conducting this month.

"The patient with early tuberculosis is much easier to cure than those with advanced disease," Dr. Kendall Emerson, managing director of the Association, points out.

Systematic search for the disease among apparently healthy persons will detect as many as eight early cases for every ten cases found. Since it is hardly practicable to search for tuberculosis in the entire population, the National Tuberculosis Association advises making the search among groups especially likely to have tuberculosis.

These are: Persons who have had close contact with the disease, high school and college students, young women between the ages of 15 and 30, middle-aged men, old people, Negroes, special occupational groups.

The help of leaders of these groups is sought in having members of the groups tested for unsuspected, early tuberculosis.

Science News Letter, April 8, 1939

AERONAUTICS

To Start Fire Tests On Airplane Engines

A CIVIL Aeronautics Authority research program to cut the fire hazard of airplane gasoline engines, most dangerous fire source aloft, was reported to the Society of Automotive Engineers.

Research engineers of the government body charged with regulating and fostering civil aviation will soon begin tests on a radial engine, the most widely used type, to develop quicker means of detecting and putting out incipient blazes and to find more fire-resistant materials of which to build motors.

Tests on the radial engine will be followed by similar studies on the other important powerplant type, the in-line motor.

Science News Letter, April 8, 1939

Benjamin Franklin was one of the early advocates of crop insurance.

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He Doesn't Like Weeds

WEEDS, weeds, weeds. How many a hopeful householder, now joyously spading his garden and sowing his seeds, will pause two or three months hence to straighten his aching back and mop his sweating brow, the while he glares malevolently at the never-conquered hosts of weeds, weeds, weeds! "Thorns also and thistles shall it bring forth to thee," was the severest part of the primal curse laid upon the earth's first gardener.

Hands across the sea—weed-stained, briar-scratched hands—will greet the new publication of Sir Charles Vernon Boys' book, *Weeds, Weeds, Weeds*. Sir Charles is an eminent physicist, with right to sign himself LL.D., F.R.S., Hon. F.R.S. Edin., and Fellow of the Imperial College; but in the presence of his green *bêtes noires* (if a bilingual Irishism may be permitted) he is just another baffled and exasperated sweating son of Adam.

It is distressingly interesting to see how many of the weeds on Sir Charles' list are all too familiar in our own gardens and lawns. We meet three species of plantain, two of thistles, as well as the sow-thistle, and the ubiquitous dan-

delion, wild mustard and that clinging, strangling vegetable devil, bindweed.

As for the latter, afflicted American farmers in the West might assure Sir Charles that he "ain't seen nothin'." An area half the size of New York State has been mastered by this one weed so completely that its farms can't be made to produce even a mortgage, and it would cost more than the land is worth to get the bindweed off it.

Britain is to be congratulated, too, if the characterization of ivy as "the one

and only tree weed" is really correct. Our trees have to contend not only with introduced English ivy but with native wild grapes, woodbine, bittersweet, poison ivy and (in the eastern states) Japanese honeysuckle.

But Sir Charles is no mere moaner and wringer of hands. He tells of herbicides which he has used successfully, and (a Scotch touch, perhaps) of turning pulled-up weeds into useful fertilizer in a solidly-built compost bin.

Science News Letter, April 8, 1939

HORTICULTURE

Don't Plunge, Is Advice On "Dirtless Farming"

MAKE haste slowly, is the gist of the advice to persons interested in growing plants by the water-culture or "dirtless farming" method, offered in a new University of California circular prepared by Drs. D. R. Hoagland and D. I. Arnon of the California Experiment Station staff.

They suggest that the water-culture method is being somewhat over-promoted, and that some of the claims made on its behalf, especially by advocates with little training in science, are doing the idea more harm than good. For certain crops in special circumstances, especially for greenhouse production, they can see possible profit in the method, but they insist upon the importance of expert supervision:

"Indispensable to profitable crop production by the water-culture method is a general knowledge of plant varieties, habits of growth, and climatic adaptations of the plant to be produced, pollination, and control of disease and insects; in other words, the same experience now needed for successful crop production in soils."

To anyone who may be contemplating water-culture production on a commercial scale, Drs. Hoagland and Arnon offer the sensibly conservative advice: try it on a small scale first.

For experimenters who want to try it in crocks or two-quart jars, just for fun, and especially for teachers' use in classroom demonstration, the California scientists' circular offers many practical, common-sense suggestions, including a formula for mixing the mineral-salt solution that is put in terms of common ounces and teaspoonfuls, instead of the usual metric units, which may be diffi-

cult for some beginners to handle.

For the immediate future at least, the arousing of interest in the ways of plant growth and the necessities of plant nutrition, demonstrable in small-scale water-culture "gardens," may well turn out to be the greatest general benefit arising from the whole broadcast discussion of "dirtless farming".

Science News Letter, April 8, 1939

AGRONOMY

Soil Temperature Governs Distribution of Grass

BLUEGRASS lawns grow best in the North, Bermuda grass lawns best in the South largely because of the soil temperature preferences of their roots. This has been determined by cooperative experiments by scientists of the U. S. Department of Agriculture and the Missouri Experiment Station, in which a number of grass species were grown under conditions of controlled soil and air temperatures.

Kentucky bluegrass roots made their best growth at a soil temperature of 60 degrees Fahrenheit and stopped at 80 degrees. This explains the "summer dormancy" of bluegrass lawns. Canada bluegrass showed a preference for temperatures about 10 degrees lower than those favored by the Kentucky variety.

Bermuda grass did not start good growth until both soil and air temperatures were 60 degrees or higher, and it continued to thrive at 100 degrees. It could not, however, tolerate the chilly 40 degrees which was good enough for at least some growth on the part of Kentucky bluegrass.

Science News Letter, April 8, 1939

PATON RANCH

Situated on a mountain stream in the foothills of the Big Horn Mountains. Here a limited number of guests are cordially welcomed.

It is a region of great geological and historical interest. Marine fossils, dinosaur bones and Indian implements are found nearby.

Guest cabins are comfortable and attractive. Food is good. The use of a saddle horse is included in the weekly rate.

Write for illustrated folder with map.

WILLIAM PATON

Shell

Wyoming

•First Glances at New Books

Natural History

HANDBOOK OF NATURE-STUDY (24th ed.)—Anna Botsford Comstock—*Comstock Pub. Co.*, 937 p., \$4. The appearance of a new edition of the Comstock nature-study handbook calls for the rejoicing that should always attend the birth of a genius' child. Bigger than any of the older editions, with more pictures and (of course) new facts, this volume upholds most worthily a monumental tradition.

Science News Letter, April 8, 1939

Biology

ESSAYS IN PHILOSOPHICAL BIOLOGY—William Morton Wheeler—*Harvard University Press*, 261 p., \$3. Selections from among the essays of the late Prof. Wheeler, at once learned and amusing, provide a worthy monument to his memory.

Science News Letter, April 8, 1939

Bacteriology

BACTERIA, THE SMALLEST OF LIVING ORGANISMS—Ferdinand Cohn—*Johns Hopkins Press*, 44 p., \$1. Translation of one of the classic papers in bacteriology, originally published in German in 1872. This slender volume will be prized by bacteriologists and those interested in the history of science.

Science News Letter, April 8, 1939

Biology

COLOR CHANGES AS CONTROLLED BY TEMPERATURE AND LIGHT IN THE LIZARDS OF THE DESERT REGIONS OF SOUTHERN CALIFORNIA—Sarah Rogers Atsatt—*Univ. of California Press*, 39 p., illus., 50 c.

Science News Letter, April 8, 1939

Bibliography

REFERENCE BOOKS OF 1935-1937—Isadore Gilbert Mudge—*Amer. Library Association*, 69 p., 90 c. An informal supplement to *Guide to Reference Books, Sixth Edition*. All librarians will want this.

Science News Letter, April 8, 1939

Zoology

FAUNA: Quarterly publication of the Zoological Society of Philadelphia. Vol. I, No. 1, March, 1939—*Pub. by the Society, 34th St. and Girard Ave., Philadelphia, Pa.*, \$1. per year, 35 c. per single copy. A new quarterly, appearing as the official organ of the Zoological Society of Philadelphia and replacing its older journal, *The Philadelphia Zoo*. This first issue features an article on lizards, one

on bird migration, and a biography of the Philadelphia Zoo's prize exhibit, the gorilla "Bamboo."

Science News Letter, April 8, 1939

Chemistry

THE PRINCIPLES OF ELECTROCHEMISTRY—Duncan A. MacInnes—*Reinhold*, 478 p., \$6. The well-known scientist of the Rockefeller Institute for Medical Research gives the picture of modern electrochemistry. The field is so broad that there is a necessary and admitted restriction of the textual material and less emphasis on the historical treatment than is usual. To most scientists Dr. MacInnes' condensation of the field into the material of interest to him is no handicap but rather the highest sort of commendation.

Science News Letter, April 8, 1939

Horticulture

THE GARDEN OF LARKSPURS—L. H. Bailey—*Macmillan*, 116 p., \$3. The book is by Liberty Hyde Bailey: what more need be said?

Science News Letter, April 8, 1939

Biography

THE MICROBE MAN: A Life of Pasteur for Young People—Eleanor Doorly—*Appleton-Century*, 160 p., \$1.50. Briskly and entertainingly written, cleanly illustrated, this is a book bound to interest the early-teen-age audience to whom it is addressed, and it may be read with profit as well as pleasure by their elders as well.

Science News Letter, April 8, 1939

Bacteriology—Biography

WILLIAM B. WHERRY, BACTERIOLOGIST—Martin Fischer—*Charles C. Thomas*, 293 p., \$4. The story of the life of one of the leaders of American medical bacteriology of the generation just past, well told and sumptuously printed. Not widely known to the public, Dr. Wherry is the more intensively appreciated by the scholars who did know him.

Science News Letter, April 8, 1939

Chemistry—Bibliography

A SURVEY OF THE AMERICAN LITERATURE IN THE FIELD OF CELLULOSE AND RELATED SUBJECTS, 1933 through 1937—Harry F. Lewis—*National Research Council*, 22 p., 20 c.

Science News Letter, April 8, 1939

Horticulture

WEEDS, WEEDS, WEEDS—Sir Charles Vernon Boys—*Wightman & Co., Ltd., London*, 115 p., 2 shillings plus postage. See page 223.

Science News Letter, April 8, 1939

Education

ORGANIZATION AND ADMINISTRATION OF PUBLIC EDUCATION—Walter D. Cocking and Charles H. Gilmore—*Govt. Print. Off.*, 183 p., 20 c. A report prepared for President Roosevelt's Advisory Committee on Education. Originally charged with the task of studying the program of federal aid for vocational education, this committee later was requested to consider the whole subject of federal relationship to state and local education.

Science News Letter, April 8, 1939

History—Economics

THE CIVILIZATION OF THE AMERICAS: Lectures Arranged by the University of California at Los Angeles, Committee on International Relations—Lesley Byrd Simpson and others—*Univ. of Calif.*, 174 p., Cloth, \$1.50, Paper \$1. Six lectures on the development of America's culture and its relations with Latin America and other parts of the world.

Science News Letter, April 8, 1939

Geography

MAN THE WORLD OVER—C. C. Carter and H. C. Brentnall—*Appleton-Century*, 508 p., \$3. A truly modern geography: it is in large print that makes for easy reading, and the pictures, maps, ingenious diagrams, and other visual aids actually receive more page space than the print. It should make geography "stick" in sixth-grade minds.

Science News Letter, April 8, 1939

Engineering

STORY PICTURES OF TRANSPORTATION AND COMMUNICATION—John Y. Beaty—*Beckley-Cardy Co.*, 223 p., illus., 88 c. This is one of the "Primary Social Studies Series" intended to teach third and fourth graders facts about present-day travel and communication. It is nicely illustrated in colors, and brings out useful points about using telephone, mail service and other facilities, besides providing informative background.

Science News Letter, April 8, 1939

Psychology

SCIENCE AND PSYCHICAL PHENOMENA—G. N. M. Tyrrell—*Harper*, 379 p., \$3.75. The author interprets what he regards as satisfactory scientific evidence of so-called ESP (extra-sensory perception), telepathy, clairvoyance, "precognition," and the communication of thought through mediums from the living or the dead.

Science News Letter, April 8, 1939